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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/708,582	11/09/2000	Shuji Ono	3562-0107P	2096

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EXAMINER
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AHMED, SAMIR ANWAR

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/708,582

Applicant(s)

ONO, SHUJI

Examiner

Samir A. Ahmed

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-25 is/are allowed.
- 6) ☒ Claim(s) 1,6-13,16-19,26 and 32-34 is/are rejected.
- 7) ☒ Claim(s) 2-5, 14-15, 27-31 is/are objected to.
- 8) ☒ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 6-19, 26, 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiomi Kakuichi, Japanese Patent Publication Number 06-167564.

As to claim 1, Kakuichi discloses an imaging apparatus for obtaining depth information of an object to be imaged (Fig. 1), comprising:

an image capturing section for capturing three or more parallaxic images of the object viewed from three or more different viewpoints which are not arrayed in a line [image pick-up equipment 3, includes three or more fish-eye lens 3a, 3b, 3c not arrayed in line and takes parallaxic images of an object or target T1 from different views (Figs. 5, 6, 7)];

a displacement detector for detecting plural displacements with respect to images of a specific region of the object, each displacement being detected between any two of the three or more parallaxic images [fish-eye image 4 which is circular taken by fish-eye lens 1 (Fig. 2). Image regions where objects T1 and T2 are detected by detecting the displacement angel ( $\theta_{a1}$ ,  $\phi_{a1}$ ) of the object image region T1 in image 4a of the fist-eye lens 3a, the displacement angel ( $\theta_{b1}$ ,  $\phi_{b1}$ ) of the object image region T1 in image 4b of the fist-eye lens 3b, and the displacement angel ( $\theta_{c1}$ ,  $\phi_{c1}$ ) of the object

image region T1 in image 4c of the fish-eye lens 3c (Fig. 3) of the fish eye image 4 made by fish lens 1 (3a, 3b, 3c) (Fig.2)]; and

a depth calculator for calculating depth information with respect to the specific region, based on the plural displacements detected by the displacement detector [depth information (Xa, Ya, Za) calculated from displacement information of image 4a, (Xb, Yb, Zb) calculated from displacement information of image 4b, and (Xc, Yc, Zc) calculated from displacement information of image 4c (Fig. 3) is used to calculate the depth information (X, Y, Z) of the object region T1 in fish-eye image 4 (Fig. 2).

As to claim 6, Kakuichi further discloses, wherein the viewpoints comprise three viewpoints, and the three viewpoints define a regular triangle (Fig. 5).

As to claim 7, Kakuichi further discloses, wherein the image capturing section includes three or more optical lenses having a wide visual angle and being located at respective three or more viewpoints, the three or more parallax images being captured by the three or more optical lenses [Fig 5, lens 1 is fish eye lens (wide visual angle)].

As to claim 8, Kakuichi further discloses, wherein each of the three or more optical lenses has an optical axis, and directions of the optical axes of the three or more optical lenses are substantially identical [Fig. 5, optical axis La, Lb, Lc, of lens 3a(1), 3b(1), 3c(1) are parallel on the same plane (substantially identical)].

As to claim 9, Kakuichi further discloses, wherein the three or more optical lenses comprise fish-eye lenses (Fig. 2, image 4 is a fish eye image made by fish-eye lens 1), and the depth calculator calculates the depth information through a whole azimuth of

Art Unit: 2623

the object captured by the fisheye lenses of the image capturing section [Fig. 3, the depth information  $(X_a, Y_a, Z_a)$ ,  $(X_b, Y_b, Z_b)$ ,  $(X_c, Y_c, Z_c)$  is calculated based on the whole azimuth of the object T1 captured by Fish eye lens 3a, 3b, and 3c of the image capturing section 3, see also Fig. 4]

As to claim 10, refer to claim 6 rejection.

As to claim 11, Kakuichi further discloses, wherein the image capturing section includes: an optical lens having a wide visual angle [Fig. image capturing section 3 includes three eye-fish lens 3a, 3b, 3c]; and a driver for moving the optical lens to the three or more viewpoints, wherein the image capturing section captures the three or more parallaxic images when the driver moves the optical lens to the three or more viewpoints [a servo system (drive) to move the camera lens, Fig. 5 shows the lens are moved to three viewpoints and the three parallaxic images are captured at those viewpoints and shown in Fig. 3].

As to claim 12, refer to claim 8 rejection.

As to claim 13, refer to claim 9 rejection.

As to claim 16, refer to claim 11 rejection. Kakuichi further discloses two optical lenses positioned at two different viewpoints [Fig. 5, lenses 3a, 3b are two optical lenses, as shown in this figure either lens 3a or 3b which is on a line drawn between the two different viewpoints  $L_a$  and  $L_b$  (line 3a-3b), can be moved to the position of lens 3c which is not on a line drawn between the two different viewpoints (line 3a-3b). Fig. 7 shows interchanged arrangement of lenses 3a, 3b, and 3c].

As to claim 17, refer to claim 7 rejection. Kakuichi further discloses moving lens 3b shown in Fig. 5, to the position of lens 3c (interchanged positions of 3b and 3c).

As to claim 26, refer to claim 1 rejection.

As to claim 18, refer to claim 12 rejection.

As to claim 19, refer to claim 13 rejection.

As to claim 32, Kakuichi further discloses an imaging apparatus (Fig. 1, items 3, 6).

As to claim 33, Kakuichi further discloses an imaging processing apparatus (Fig. 1, item 6).

As to claim 12, Kakuichi further discloses the system includes a computer (Fig. 1, items 10, 11)

***Allowable Subject Matter***

3. The following is a statement of reasons for the indication of allowable subject matter: the instant invention is a method, apparatus, system and a recording medium for obtaining depth information of an object. The closest art Kakuichi (Japanese Publication 06-167564), discloses a system and device for detecting position (x, y, z) (depth information of an object using a fish-eye lens. The limitation "wherein ratios for consideration of the plural displacements are changed with respect to the specific region", recited in independent claims 20, 24, and 25 is not disclosed by Kakuichi or the prior art of record.

4. Claims 20-25 are allowed.

Art Unit: 2623

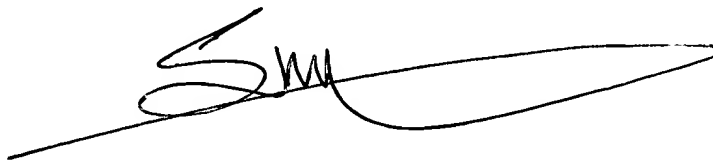
5. Claims 2-5, 14-15, 27-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir A. Ahmed whose telephone number is 703-305-9870. The examiner can normally be reached on Mon-Fri 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-303-3900.

SA

A handwritten signature in black ink, appearing to be 'SA' followed by a stylized, elongated flourish.

**SAMIR AHMED  
PRIMARY EXAMINER**